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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

THOMPSON, JR, OTIS L

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/594,951	Applicant(s) GIACOMAZZI ET AL.	
	Examiner OTIS L. THOMPSON, JR	Art Unit 2477	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-28, 30-37 and 39-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-39 and 41-44 is/are rejected.
- 7) ☒ Claim(s) 31 and 40 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>9/22/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

Response to Arguments

1. Applicant's arguments with respect to claims 23 and 34 have been considered but are moot in view of the new ground(s) of rejection. Applicant's amendment to incorporate allowable subject matter into claims 23 and 34 is insufficient to overcome rejection because the entirety of the indicated allowable subject matter was not incorporated into claims 23 and 34. Further search and consideration of the prior art with respect to amended claims 23 and 34 has revealed applicable prior art. Accordingly, this action is made final.

DETAILED ACTION

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 23, 24, 30, 33, 34, 35, 39, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa et al. (US 5,666,655) in view of Nathanson (US 2002/0150050 A1) in view of Krishnamurthy et al. (US 2003/0053424 A1).

4. **Regarding claims 23 and 34**, Ishikawa et al. discloses *a method of and a MAC layer* (In Ishikawa et al., a base station allocates channels to groups of mobile stations [See Abstract]. It is well known in the art that this channel allocation is performed by the MAC layer) *controlling access by mobile users of a communications network to a shared communication medium, wherein the shared communication medium is partitioned into a plurality of individual*

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communication channels that can be individually exploited for communications between network users (Abstract, see "...dynamic channel allocation scheme...available radio channels...", i.e. Plurality of channels for communications between users), *the method comprising and the MAC layer granting access to the shared medium by:*

- a. *Determining the existence of at least one main direction of movement of the network users* (Column 13 line 65-Column 14 line 5, see "...mobile stations [i.e. network users] into a plurality of groups according to...moving directions...", i.e. A main direction of movement has to be determined in order to group mobile stations), *said main direction of movement being a direction around which directions of movement of a number of network users are clustered* (Column 13 line 65-Column 14 line 5, Mobile stations having same moving directions are grouped together. Their individual directions are obviously clustered around a main direction because the mobile users are considered a group based on their moving directions);
- b. *Associating a group of communication channels within said plurality of communication channels to the at least one main direction of movement* (Column 13 65-Column 14 line 5, see "...radio channels are allocated by dividing the mobile stations into a plurality of groups according to the features of the mobile stations such as...moving directions...");
- c. *Reserving the communication channels of said group to the network users moving substantially in said main direction of movement* (Figure 18 Memory 17B wherein channels are reserved and assigned to specific groups based on moving direction threshold).

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Ishikawa et al. does not specifically disclose *a substantially infrastructureless communications network*. However, Nathanson discloses an automotive telemetry protocol wherein a number of channels are devoted to ad hoc networking with respective channels being reserved for specific directions of movement of network users (Paragraph 0319-0320 and Figure 20). As stated in paragraph 0320, these teachings avoid unnecessary channel contention between vehicles.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Nathanson into Ishikawa et al. in order to avoid channel contention between mobile stations.

Ishikawa et al. in view of Nathanson does not specifically disclose *wherein the determining the existence of at least one main direction of movement includes: calculating a distribution of movement directions of at least neighboring network users of the network users that are clustered; and analyzing the distribution, wherein the analyzing includes determining peaks in the distribution*.

However, Krishnamurthy et al. discloses a wireless network consisting of at least one satellite and a plurality of mobile ad hoc nodes. The nodes are clustered into mobile groups (Abstract), and the overall general direction of motion of a group is governed by the group motion of the cluster in a domain served by a specific gateway (Paragraph 0069). Hence, as pictured in figure 1, there are different directions of movement for clusters which are tracked and known by the satellite. The specific motion of individual nodes within the clusters may be random, but the general direction again is governed by the group motion (i.e. *calculating a distribution of movement directions of at least neighboring network users of the network users*

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that are clustered) (Paragraph 0069). It is thus obvious that the general direction (i.e. *main direction*) of the group is determined by first knowing the individual directions of the nodes (i.e. *analyzing the distribution, wherein the analyzing includes determining peaks in the distribution*). The satellite also determines mobility pattern for the group (i.e. *peaks in the distribution*) based various factors, those factors including direction of motion and velocity of the individual nodes being tracked (Paragraph 0069). This analysis performed by the satellite allow for the optimization of pre-defined performance criterion, such as power, overhead, and throughput (Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Krishnamurthy et al. into the system of Ishikawa et al. in view of Nathanson in order to optimize power, overhead, and throughput between the wireless nodes and the satellite.

5. **Regarding claim 24**, Ishikawa et al. in view of Nathanson in view of Krishnamurthy et al. discloses *grouping the communication channels into a number of groups depending on a plurality of main directions of movement, and reserving different groups of channels to respective main directions of movement* (Ishikawa et al., Figure 18 Table 17B, Each group has a different moving directions, and different channels are allocated to the groups based on these moving directions).

6. **Regarding claim 25**, Ishikawa et al. in view of Nathanson in view of Krishnamurthy et al. discloses *wherein each channel group comprises a number of channels that depends on a number of users having directions of movement clustered around the respective main direction of*

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movement (Ishikawa et al., Figure 18 Table 17B, Each group has a different moving directions, and different channels are allocated to the groups based on these moving directions).

7. **Regarding claims 33 and 42**, Ishikawa et al. in view of Nathanson in view of Krishnamurthy et al. discloses *reserving a group of channels of said plurality of channels to network users not having a direction of movement clustered around the at least one main direction of movement* (Nathanson, Paragraph 0320, see "...allocate 4 of the 10 channels for ad hoc and to divide the compass into four quadrants...", This suggests each quadrant contains users moving in the same direction and each direction has a reserved channel. The remaining channels would be for users not in those directions having reserved channels).

8. **Regarding claims 30 and 39**, Ishikawa in view of Nathanson in view of Krishnamurthy et al. discloses *wherein the number of network users having direction of movement clustered around each peak is determined, and a peak is validated as a main direction of movement, provided that the respective number of network users exceeds a prescribed value* (Ishikawa et al., see Abstract, wherein the system determines thresholds (i.e. number of network users exceeds a prescribed value) for grouping mobile stations; Column 13 65-Column 14 line 5, see "...radio channels are allocated by dividing the mobile stations into a plurality of groups according to the features of the mobile stations such as...moving directions..."; Hence, when dividing the mobile stations into groups according to moving directions, a threshold number of mobile stations have to moving in the same direction in order for a group/cluster for a main direction of movement).

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9. Claims 26-29, 32, 35-38, 41, 43, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa in view of Nathanson in view of Krishnamurthy et al. as applied to claims 1 and 34 above, and further in view of Liu et al. (US 2005/0088318 A1).

10. **Regarding claims 26 and 35**, Ishikawa in view of Nathanson in view of Krishnamurthy et al. discloses the claimed invention above but does not specifically disclose *wherein each network user/MAC layer of a network user communicates to other network users/MAC layers of network users information concerning the direct of movement of the network user*. However, Liu et al. discloses a vehicle-to-vehicle communication protocol wherein in an ad hoc network, a vehicle broadcasts a message specifying motion information (including driving direction) to surrounding vehicles (Paragraph 0032). This clearly allows the vehicle to know which other vehicles are in communication range.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the teachings of Liu et al. into the system of Ishikawa in view of Nathanson in view of Krishnamurthy et al. in order know which mobile stations are in communication range.

11. **Regarding claims 27 and 36**, Ishikawa in view of Nathanson in view of Krishnamurthy et al. in view of Liu et al. discloses *wherein said information concerning the respective direction of movement comprises information on a network user's velocity vector* (Liu et al., Paragraph 0032, see "...messages specify motion information...speed, driving direction, and acceleration...").

12. **Regarding claims 28 and 37**, Ishikawa in view of Nathanson in view of Krishnamurthy et al. in view of Liu et al. discloses *wherein said information on the network user's velocity*

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vector is obtained by exploiting a GPS-based detector (Liu et al, Abstract, see "...vehicles may or may not be equipped with GPS or DGPS receivers...may be equipped with digital maps...";

Nathanson, Paragraph 0104, see GPS information).

13. **Regarding claims 29 and 38**, Ishikawa in view of Nathanson in view of Krishnamurthy et al. in view of Liu et al. discloses *each network user calculating a distribution of movement directions of at least the neighboring users, and determining the at least one main direction of movement by analyzing such a distribution* (Liu et al., Paragraph 0032, see "...messages specify motion information...speed, driving direction, and acceleration...", i.e. Each vehicle knows this information about surrounding vehicles; Paragraphs 0058-0061 wherein zones can be defined for vehicles traveling in the same direction so that alerts can be broadcasted to other vehicles in emergency situations).

14. **Regarding claims 32 and 41**, Ishikawa in view of Nathanson in view of Krishnamurthy et al. in view of Liu et al. discloses *wherein said one communication channel of the group is assigned to the network user substantially on a random basis* (Ishikawa et al., Figure 18 Table 17B, Channel assigned in accordance with movement direction; Nathanson, Paragraph 0106 Channel assignment in accordance with GPS heading [i.e. direction]).

15. **Regarding claim 43**, Ishikawa in view of Nathanson in view of Krishnamurthy et al. in view of Liu et al. discloses *a transmitter for a mobile user of a substantially infrastructureless communications network comprising a MAC layer according to claim 34* (Nathanson presents an ad hoc network of vehicles in which vehicles exchange [i.e. transmit to one another] identity messages containing GPS information [Paragraph 0104]; Liu et al. presents vehicle-to-vehicle

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communication in an ad hoc network in which vehicles exchange [transmit to one another] motion information [Paragraph 0032]; Also refer to the detailed rejection of claim 34 above).

16. **Regarding claim 44**, Ishikawa in view of Nathanson in view of Krishnamurthy et al. in view of Liu et al. discloses *a substantially infrastructureless communications network with mobile network users acting as communication traffic routers* (Nathanson and Liu et al. present ad hoc networks in which vehicles communicate with one another and act as routers), *wherein the network transmitters according to claim 43* (Nathanson presents an ad hoc network of vehicles in which vehicles exchange [i.e. transmit to one another] identity messages containing GPS information [Paragraph 0104]; Liu et al. presents vehicle-to-vehicle communication in an ad hoc network in which vehicles exchange [transmit to one another] motion information [Paragraph 0032]; Also refer to the rejection of claim 43 and the detailed rejection of claim 34 above).

Allowable Subject Matter

17. Claims 31 and 40 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach that mobile stations or vehicles are able to analyze a distribution of movement of mobile stations or vehicles and determine velocity vectors, including average velocity and relative average velocity, in order to validate a direction of movement based on the average velocity in relation to a threshold.

Conclusion

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to OTIS L. THOMPSON, JR whose telephone number is (571)270-1953. The examiner can normally be reached on Monday to Thursday 7:30 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chirag Shah can be reached on (571)272-3144. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Otis L Thompson, Jr./
Examiner, Art Unit 2477

November 5, 2010

/Chirag G Shah/

Supervisory Patent Examiner, Art Unit 2477